

CLAIMS

1. A mixer for use in a syringe system, the mixer comprising:
a main body having a first surface, a second surface, first and second ends, and of a size and configuration adapted to be held at least partially within a tip of a syringe;

the first surface partially defining a first channel when held at least partially within the tip of a syringe, the first channel extending from the second end of the main body to the first end of the main body,

the second surface partially defining a second channel when held at least partially within the tip of a syringe, the second channel extending from the first end of the main body to the second end of the main body;

a first valve flap extending outwardly from the main body and located at the first end of the main body for selectively opening and closing the first channel when the main body is held at least partially within the tip of a syringe; and

a second valve flap extending outwardly from the main body and located at the second end of the main body for selectively opening and closing the second channel when the main body is held at least partially within the tip of a syringe.

2. A mixer as recited in claim 1, wherein the main body further comprises at least one flange extending therefrom.

3. A mixer as recited in claim 2, wherein the first valve flap and the second valve flap are cantilevered flexible zones of the main body.

4. A mixer as recited in claim 1, wherein the main body and the first and second valve flaps are integrally formed as a single piece.

5. A mixer as recited in claim 1, the mixer being formed from at least one of a thermoplastic elastomer or a thermoset material.

6. A mixer as recited in claim 1, the mixer being formed from one or more of polyethylene, polypropylene, neoprene, or an olefin.

7. A mixer as recited in claim 1, the mixer being formed from a material having a durometer hardness of about 70.

8. A syringe and mixer system comprising:
- a syringe having a tip; and
- a mixer configured to be held at least partially within the tip of the syringe,
- the mixer comprising:

a main body having a first surface, a second surface, and first and second ends, and of a size and configuration adapted to be held at least partially within the tip of the syringe;

the first surface and a first portion of an interior surface of the tip of the syringe defining a first channel, the first channel extending from the second end of the main body to the first end of the main body, the first channel having a primary opening at the second end of the main body and a secondary opening at the first end of the main body;

the second surface and a second portion of an interior surface of the tip of the syringe defining a second channel, the second channel extending from the first end of the main body to the second end of the main body, the second channel having a primary opening at the first end of the main body and a secondary opening at the second end of the main body;

a first valve flap extending outwardly from the main body and located at the first end of the main body for selectively opening and closing the secondary opening of the first channel; and

a second valve flap extending outwardly from the main body and located at the second end of the main body for selectively opening and closing the secondary opening of the second channel.

9. A syringe and mixer system as recited in claim 8, wherein the syringe is a male syringe.

10. A syringe and mixer system as recited in claim 9, wherein the syringe and mixer are integrally formed together.

WORKMAN NYDEGGER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
1000 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
SALT LAKE CITY, UTAH 84111

11. A two syringe mixing apparatus, comprising:
- a first syringe having a tip;
 - a second syringe having a tip; and
 - a mixer configured to be held at least partially within the tip of the first syringe, the mixer comprising:

- a main body having a first surface, a second surface, and first and second ends, and of a size and configuration adapted to be held at least partially within the tip of the first syringe;

- the first surface and a first portion of an interior surface of the tip of the first syringe defining a first channel, the first channel extending from the second end of the main body to the first end of the main body, the first channel having a primary opening at the second end of the main body and a secondary opening at the first end of the main body;

- the second surface and a second portion of an interior surface of the tip of the first syringe defining a second channel, the second channel extending from the first end of the main body to the second end of the main body, the second channel having a primary opening at the first end of the main body and a secondary opening at the second end of the main body;

- a first valve flap extending outwardly from the main body and located at the first end of the main body for selectively opening and closing the secondary opening of the first channel;

- a second valve flap extending outwardly from the main body and located at the second end of the main body for selectively opening and closing the secondary opening of the second channel; and

the second syringe being coupled to the first syringe.

12. A two syringe mixing apparatus as recited in claim 11, wherein the apparatus is configured such that material flowing through the channels is expressed through the secondary openings in an outward direction such that the exit pattern of a flow path of one material is substantially remote and nonparallel with the entrance pattern of a flow path of another material, thereby creating a churning action to optimally mix the materials.

13. A two syringe mixing apparatus as recited in claim 11, wherein a flow path defined by the first channel is substantially distinct from a flow path defined by the second channel.